



AP/1746  
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**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

In re application of: PATRICK et al.

Attorney Docket No.:  
LAM1P061/P0318

Application No.: 08/925,985

Examiner: MARKOFF, Alexander

Filed: September 9, 1997

Group: 1746

Title: APPARATUS FOR IMPROVING ETCH  
UNIFORMITY AND METHODS THEREFOR

**CERTIFICATE OF MAILING**

I hereby certify that this correspondence is being deposited with the U.S. Postal Service with sufficient postage as first-class mail on September 22, 2004 in an envelope addressed to: Mail Stop Appeal Brief-Patents, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Signed: Sue Funchess  
Sue Funchess

**TRANSMITTAL OF REPLY BRIEF  
IN RESPONSE TO EXAMINER'S ANSWER**

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P.O. Box 1450  
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Sir:

Transmitted herewith in triplicate is the Reply Brief in Response to Examiner's Answer mailed August 23, 2004.

This reply brief is being filed within two (2) months of the mailing date of the Examiner's Answer.

Applicant believes that no extension of term is required. If an additional extension of time is required, however, please consider this a petition therefor.

Charge any additional fees or credit any overpayment to Deposit Account No. 50-0388 (Order No. LAM1P061).

Respectfully submitted,  
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**PATENT**

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES**

**EX PARTE PATRICK et al.**

**Application for Patent**

**Filed: September 9, 1997**

**Serial No. 08/925,985**

**FOR:**

**APPARATUS FOR IMPROVING ETCH UNIFORMITY AND METHODS THEREFOR**

**REPLY BRIEF IN RESPONSE TO EXAMINER'S ANSWER**

**CERTIFICATE OF MAILING**

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Signed: Sue Funchess  
Sue Funchess  
Secretary to Michael Lee, Reg. No. 31,846

**BEYER WEAVER & THOMAS, LLP**  
**Attorneys for Applicants**

This is in response to the Examiner's Answer dated August 23, 2004.

### **Response to Examiner's Answer**

#### **1) Related Appeals and Interferences**

The appellant would like to make clear that the designation "N/A" for Related Appeals and Interferences, indicates that no related appeals or interferences are known to the appellant or appellant's legal representative that would directly affect or be directly affected by or have a bearing on the Board's decision in the pending case.

#### **2) Issues**

The appellant appreciates the Examiner's comments under "Issues" on page 3 of the Examiner's answer, where the Examiner has withdrawn the rejection of claims 1, 2, 7, and 33 under 35 USC 102 over Hills et al., the rejection of claim 33 under 35 USC 103 over Hills et al, the rejection of claims 26-28 made under 35 USC 112(2) and the rejection of claims 4-6, 8-10, 26-30, and 32 made under 35 USC 103 over Hills et al in view of Abraham and Abraham et al.

#### **2) Response to Examiner's Response to Argument**

##### **Response to Argument Regarding 35 USC 112(2) rejections:**

Regarding Group I (claims 1, 2, 7, 8, 10), Group II (claims 4, 5, 6), Group III (claim 9), Group IV (claims 25, 29, and 31-33), and Group VI (claim 30) the Examiner states that the terms "pure" and "substantially pure" are indefinite and lack comparative basis, so that one of ordinary skill in the art would be able to measure inclusions or appreciate the distinction.

The Examiner agrees that Andrew Corp. V. Gabriel Electronics, 847 F 2<sup>nd</sup> 816, 6 USPQ2d 2010 (Fed. Cir. 1988) teaches that "substantially equal" is not indefinite, but the Examiner still takes the position that "pure" and "substantially pure" are indefinite, stating that the decision that "substantially equal" is definite does not support the definiteness of "pure" and "substantially pure". Webster's New World Dictionary, Third College Edition, published 1994,

defines "pure" as "free from an adulterant; unmixed." From this definition, the appellant believes that determining whether something is "pure" is just as definite as determining whether something is "equal." In addition, the appellant contends that "substantially pure" is as definite as "substantially equal".

The Examiner asserted that United Carbon Co. v. Binney & Smith Co., 317 US 228, 55 USPQ 384-385 (1942) to support his assertion that "substantially pure" is indefinite. This case under head note 2 does discuss the use of the word "substantially pure". Under the head note testimony is discussed where a different meaning of the term is used instead of the plain meaning. Although, the Court ruled that the claims are indefinite, nothing in the decision states that the phrase "substantially pure" is indefinite. The Examiner failed to point to any wording in this decision that states that the phrase "substantially pure" is indefinite. As a result, the appellant asserts that the discussion of this phrase, without a statement by the Court that it is indefinite, helps to prove the definiteness of "substantially pure."

#### USE OF THE WORD "COMPRISING"

The appellant believes that the Examiner is improperly interpreting the phrases "comprising pure aluminum" in claim 4 and comprises "99.99% pure aluminum" in claims 9 and 30. In Re Kreokel and Phaff 504 F.2d 1143, 183 USPQ 610 (CCPA 1974) interprets a resin system comprising 20% to 80% of a polyester as the resin containing 20% to 80% of the polyester. It is not suggested in that case that even though the word "comprising" is used that additional ingredients may be added so that even though 20% to 80% polyester is first added the final resin with the added ingredients is less than 20% polyester, due to the dilution of the polyester. The Examiner interprets claim 9 as saying that the pure metallic material starts with 99.999% pure Al and then the word "comprises" allows other ingredients to be added to dilute the pure metallic material so that it is not 99.999% pure Al. Such an interpretation is contrary to In Re Kreokel and Phaff. The plain meaning of a pure metallic material comprising 99.999% pure Al, is that at least 99.999% of the metallic material is Al, so that up to 0.001% of the metallic material may be something other than Al (hence the word "comprise"), just as in In Re Kreokel and Phaff the resulting resin has polyester and other elements so that the polyester made up 20% to 80% of the resin.

#### **Response to Argument Regarding 35 USC 102 rejection over Ye et al (5,891,348):**

Regarding Group I (claims 1, 2, 7, 8, 10) and Group IV (claims 25, 29, and 31-33) the Examiner's line of reasoning appears to be that Ye allows at least some reactive gas to contact the ring (109, 112), and that the etching rate is substantially equalized across the substrate and therefore the ring would be inherently etched at least to some extent during the etching of the aluminum layer of the substrate. The Examiner's inherency argument presumes that the ring in Ye must be etched, since the same materials on the substrate are etched. This presumption requires that ring be exposed to sufficiently similar conditions as the substrate, so that the ring can be etched.

The Examiner does not provide any evidence from Ye that supports this. The Examiner does not provide any support from Ye that states that the reactive process gas flows into the channel 100. Col. 4, lines 63, to column 5, line 2, of Ye teaches that non-reactive gas or exhausted process gas flows into the channel to maintain substantially uniform gas across the surface of the substrate, which does not include the ring. As a result, the gas composition in the channel 100 is different than the gas composition above the substrate. At a minimum, Ye says that uniformity of the gas is only maintained above the substrate, not above the ring. At most, Ye says that the gas flowing in the channel is non-reactive gas and exhausted process gas, not reactive gas.

In addition, FIG. 2 of Ye shows that the ring 109 is covered, where the substrate 25 is not covered. This results in the ring 109 being protected from accelerated charged particles, to which the substrate 25 is exposed. In the etching of metal, accelerated charged particles in the plasma may be used for the metal etch. The substrate is not covered to allow the accelerated particles to etch part of the substrate. The ring in Ye however is covered. As a result, the etching of aluminum on the substrate does not mean that the covered ring 109 of Ye is inherently simultaneously etched.

These two conditions, different gas exposure and different charged particle exposure, are sufficient to overcome the Examiner's inherency argument.

In addition, since Ye teaches that it is desirable to provide a width of the channel 100 to provide a more uniform etch of the substrate, by uniformly distributing the process gas, it would be undesirable in Ye to etch the ring 109, which would change the channel width 100, which would change the uniformity of the distribution of the process gas, which would change the uniformity of the etch of the substrate. In addition, the etching of the ring would require replacement of the ring 109, which would increase costs. Therefore, such etching of the ring would be undesirable in view of Ye.

In response to the arguments regarding Group III and Group VI, the use of the word "comprising" is discussed above.

**Response to Argument Regarding 35 USC 103 rejection over Hills et al. (5,685,914) in view of any one of Shamoulian et al (6,095,084), Kao et al. (6,125,859), Zhao et al. (5,558,717), Bhan et al. (6,090,167), Rossman et al. (6,077,357), and Ye et al. (5,891,348):**

The crux of the Examiner's argument is that it would be obvious to take the etcher of Hills with an etch resistant anodized aluminum ring and to replace the etch resistant anodized aluminum ring with an aluminum ring and to use it in a process where aluminum is etched, which causes increased etching of the aluminum ring. The appellant contends that it would not be obvious to make parts of the chamber more susceptible to corrosive wear. In fact, Hills, on page 2, lines 45 to 50, states that part of the purpose of Hills is to reduce corrosive wear of the chamber walls.

Although, the Examiner states that the other references teach that aluminum and aluminum oxide may be interchangeable, the Examiner has not given a motivation as to why an etch resistant surface aluminum oxide surface as taught by Hills et al. would be replaced with a pure metallic surface that could be etched. In Hills et al. it would be desirable to have an etch resistant surface to increase the life of the device. It would not be obvious to replace an etch resistant surface of anodized aluminum with an aluminum surface. Although the other references may teach that it may be possible to replace anodized aluminum with aluminum, a motivation for doing this in Hills et al. is not provided. The declaration states that it would not be obvious to replace the etch resistant anodized aluminum of Hills et al with a sacrificial pure aluminum.

### **3) Conclusion**

For the reasons set forth here and in the Appeal Brief, it is respectfully submitted that none of the pending claims are definite and are not anticipated or made obvious by the cited

references. Accordingly, it is respectfully submitted that the pending rejections of all of the claims should be reversed.

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